9. Integrated Resource Plan and Risk Analysis

Highlights

- *Ameren Missouri has developed a robust range of alternative resource plans that reflect different combinations of energy efficiency ("EE"), demand response ("DR"), various types of new renewable and conventional generation, energy storage, and retirement of each of its existing coal-fired generators.*
- *In addition to the scenario variables and modeling discussed in Chapter 2, one critical independent uncertain factor has been included in the final probability tree for risk analysis: demand-side management ("DSM") costs.*
- *Our risk analysis also includes the evaluation of a range of load growth.*

Ameren Missouri's modeling and risk analysis consisted of a number of major steps:

1. Identification of **alternative resource plan attributes**. These attributes represent the various resource options used to construct and define alternative resource plans – demand side resources, new renewable and non-renewable supply side resources, and retirement of existing supply side resources.
2. Development of the **baseline capacity position**, which reflects forecasted peak demand, reserve requirements and existing resources.
3. Development of **planning objectives** to guide the development of alternative resource plans.
4. Development of the **alternative resource plans**. The alternative resource plans were developed using the plan attributes identified in step 1, the base capacity position developed in step 2, and the planning objectives identified in step 3.
5. Identification and screening of **candidate uncertain factors**, which are key variables that can influence the performance of alternative resource plans.
6. **Sensitivity analysis** and selection of critical uncertain factors, which are key variables that are determined to have a significant impact on the performance of alternative resource plans.

position). The customer needs include peak load reductions due to RAP EE, distributed energy resources ("DER"), and DR. The system capacity includes the capacity benefit of the RES Compliance portfolio. Retirement dates reflected in the base capacity position for existing coal-fired units are those established in Ameren Missouri's most recent depreciation study filed with the Missouri Public Service Commission ("MPSC") and are considered to be the base retirement dates.

Retirements and Modifications[3]

Ameren Missouri is considering retirement of some or all of its six older gas- and oil-fired CTG units – Fairgrounds, Meramec CTG-1, Meramec CTG-2, Mexico, Moberly, and Moreau – with a total summer net capacity of 263 MW, over the next 20 years. Chapter 4 - Table 4.3 provides a summary of the planned CTG retirements. The CTG retirements were included in all alternative resource plans.

Coal energy center retirements were also included in the capacity planning process. Meramec retirement by December 31, 2022 is included in all alternative resource plans. Two different Sioux retirement options were considered: 1) retirement by December 31, 2033 based on prior analysis of Ameren Missouri's coal power plant life expectancy by Black and Veatch, and 2) retirement by December 31, 2028. Three different retirement options for Labadie were considered: 1) current retirement dates as determined by the Black and Veatch life expectancy study with two units retired by December 31, 2036 and two units retired by December 31, 2042, 2) two units retired by December 31, 2028 and two units retired by December 31, 2036, 3) all four units retired by December 31, 2028. Four retirement dates were evaluated for Rush Island: 1) retired by December 31, 2045, which is the current retirement date as determined by the Black and Veatch life expectancy study, 2) retired by December 31, 2039, 3) retired by December 31, 2028, and 4) retired by ***_____***.

The alternative retirement dates were based on the ability to avoid significant ongoing costs, the potential for an explicit price on carbon starting in 2025 included in the scenarios described in Chapter 2, coupled with the time needed to ensure transmission upgrades are in place to continue to reliably serve our customers. ***_____
_____
_____*** are included in order to evaluate specific potential outcomes pending a final judgment in the Rush Island New Source Review ("NSR") litigation which is under appeal and a decision by the federal court of appeals is not expected until 2021. Importantly, numerous potential

[3] EO-2020-0047 1.D; EO-2020-0047 1.O

outcomes are possible, including reversal of the trial court's rulings on both liability and remedy, and the actual outcome may be different than the limited outcomes modeled.

DSM Portfolios

DER, EE, and DR programs as described in detail in Chapter 8 are included in the DSM portfolios. DSM programs not only reduce the peak demand but also reduce reserve requirements associated with those DRs. The following combinations of DSM portfolios were evaluated: 1) RAP, 2) MAP, 3) DOPE1, 4) DOPE2, and 5) No DSM after MEEIA Cycle 3. The No DSM portfolio reflects completion of Ameren Missouri's current program cycle with no further EE or DR during the planning horizon. Note that the recent MPSC approval of Ameren Missouri's request for a one-year extension of MEEIA programs occurred after the IRP analysis was underway, which means that the No Further DSM portfolio starts one year before that extension ends.[4]

Renewable Portfolios[5]

Compliance with Missouri's RES was updated to reflect current assumptions, including baseline revenue requirements and an updated 10-year forward-looking model which calculates the impact of the statutory 1% rate impact limitation.

Ameren Missouri performed its RES compliance analysis with the *2020 IRP RES Compliance Filing Model* (model). The model is designed to calculate the retail rate impact, as required by the Commission's RES rules.[6] This model determines the quantity of renewable energy needed to meet both the overall RES portfolio standard and the 2% solar portfolio standard "carve-out" absent any rate impact constraints. The model then determines the amount of renewable energy, both solar and non-solar that can be built without exceeding an average 1% revenue requirement increase over a ten-year period. Ameren Missouri's expected renewable energy credit (REC) position is presented in Figure 9.3.

[4] The extension of MEEIA Cycle 3 should not have a material impact on the analysis.
[5] EO-2020-0047 1.R
[6] 20 CSR 4240-20.100(5)